Appl. No. 09/838,868
Reply Filed: Nov. 1, 2004
Reply to the Office Action mailed: July 1, 2004

REMARKS

In response to the Office Action mailed July 1, 2004, the Applicant submits this Reply. In view of the foregoing amendments and following remarks, reconsideration is requested.

Claims 1-30 remain in this application, of which claims 1, 5, 10, 14, 19 and 23 are independent. Applicant originally paid for 20 total claims and 3 independent claims. A fee of $444.00 is due for the 10 additional total claims and 3 additional independent claims for this amendment.

In the foregoing amendments, claims 1, 3-10 and 12-18 have been amended and claims 19-30 have been added. Claims 2 and 11 are unchanged.

In the Office Action, claims 1-4, 9-13 and 18 were rejected. Claims 5-8 and 14-17 were objected to.

Allowable Claims

The subject matter of claims 5-8 and 14-17 was indicated as being allowable. Claims 5 and 14 have been rewritten in independent form, incorporating some, but not all, of the limitations of claims 1 and 10 respectively. These claims also have been amended to clarify, and otherwise provide proper antecedent basis for, various terms used therein. It is respectfully submitted that claims 5-8 and 14-17 as rewritten are allowable over Lu, Cronin and Aggarwal cited in the Office Action.

Rejection Under 35 U.S.C. §102

Claims 1-3, 10-12 were rejected under 35 U.S.C. §102(e) in view of U.S. Patent No. 6,563,874 ("Lu"). The rejection is respectfully traversed.

According to Lu, "[i]n motion estimation a vector is determined which relates the content of one video frame to the content of another video frame." *Lu*, Col. 1, lines 52-54. "Use of such motion estimation enables video recording to use fewer bits . . . because the background portion of the scene can be characterized as having the same . . . data as the preceding frame, while the object in the foreground can be characterized as being essentially the same as an earlier frame, but moved to a new location." *Lu*, Col. 1, lines

56-62. In particular, Lu teaches that "[e]ach of the reference frame and the current frame include background and foreground data. The operation is carried out by selecting a block [of pixels] of the current frame for analysis, then determining whether the block selected is a foreground block or a background block." *Lu*, Col. 3, lines 20-28, and see *Lu*, Col. 1, line 38. Lu further describes how this determination is made at Col. 6, lines 16-40. The selected block is then compared to a block of the reference frame, according to whether the selected block is a considered a foreground block or background block, to provide a motion vector. See *Lu*, Col. 6, lines 41-56. The motion vector is used with other information to encode the image data. See *Lu*, Col. 6, lines 57-62.

In sum, Lu merely generates a set of motion vectors, with each motion vector corresponding to a block of pixels in an image and characterizing motion of objects from the image to a subsequent image.

The Office Action asserts that Lu's statement that the foreground is "moved to a new location" indicates that Lu teaches changing a set of motion vectors. Applicant respectfully disagrees. A motion vector characterizes the movement of a foreground object from its location in a first image to its location in a second image. Hence, Lu states that "the object in the foreground can be characterized as being essentially the same as an earlier frame, but moved to a new location." *Lu*, Col. 1, line 62. This excerpt of Lu does not say that the motion vectors characterizing this movement of the foreground is in any way "changed."

The limitations of claims 1 and 10 *include* "determining a set of motion vectors" (but now amended to states that "wherein the set of motion vectors includes a vector for each pixel describing motion of the pixel from the first image to the second image," further distinguishing claim 1 from Lu)

In contrast to Lu, however, claims 1 and 10 also recite, given this set of motion vectors, "modifying motion vectors ... corresponding to ... selected ... portions" of the image. Lu merely teaches how to obtain a set of motion vectors for blocks of pixels, but not how to modify those motion vectors after they are obtained.

Accordingly, independent claims 1 and 10 are allowable over Lu. The remaining claims are dependent claims that are allowable for at least the same reasons.

Rejection Under 35 U.S.C. §103

Claims 4 and 13, were rejected under 35 U.S.C. §103 (a) as being unpatentable over Lu in view of U.S. Patent 6,249,613 ("Crinon"). The rejection is respectfully traversed.

Lu is discussed above, and merely teaches generating a set of motion vectors, with each motion vector corresponding to a block of pixels in an image and characterizing motion of objects from the image to a subsequent image.

According to Crinon, "[a] global motion model representing camera motion between the first and second image is applied to the macroblocks in the second image. The global vector maps the macroblocks to a corresponding second image sample array in the first decoded image. Global residuals between the macroblocks and the second image array are derived. When the global residuals are greater than the INTER1V frame residuals, the marcroblocks are classified as foreground. When the INTER1V frame residuals are greater than the global residuals, the macroblocks are classified as background. By comparing the global residuals to the INTER1V frame residuals derived from the previously decoded image the mosaic can be automatically updated with the image content of the macroblocks likely to be background." *Crinon*, Col. 2, line 65 to Col. 3, line 11.

Both Lu and Crinon deal with motion vectors that are associated with macroblocks of pixels and decisions of whether those macroblocks are in the foreground or in the background. In contrast, claims 1 and 10, from which claims 4 and 13 depend, recite determining a motion vector *for each pixel*. Claims 4 and 13 have been amended to clarify the function of the claimed "combination map," as described on page 6 of the specification. In particular, the combination map indicates, "for motion vectors in the identified region, whether pixels in a background image only, a foreground image only, or both the background image and the foreground image, from the identified region are used to generate an output image using the motion vectors." Neither Crinon nor Lu teaches or suggests this combination of limitations.

Accordingly, the rejection of claims 4 and 13 is traversed.

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Rejection Under 35 U.S.C. §103

Claims 9 and 18, were rejected under 35 U.S.C. §103 (a) as being unpatentable over Lu in view of U.S. Patent 6,408,293 ("Aggarwal"). The rejection is respectfully traversed.

Lu is discussed above, and merely teaches generating a set of motion vectors, with each motion vector corresponding to a block of pixels in an image and characterizing motion of objects from the image to a subsequent image.

According to Aggarwal, multimedia objects are segmented and this segmentation is displayed to a user. The user may indicate whether it is satisfied with the segmentation results. The multimedia object may be re-segmented based on this user feedback. Segmentation of a video sequence may be based on motion vectors in the video sequence. See Col. 4, lines 12-50.

In contrast, claims 9 and 18 as amended recite displaying a color image wherein "each pixel in the color image is defined by a motion vector corresponding to the pixel in the set of motion vectors." This phrase distinguishes the claimed color image from the segmentation that is displayed in Aggarwal.

Moreover, claims 9 and 18 also recite "allowing the user to modify the color image" and "changing the set of motion vectors according to the modified color image." Aggarwal only changes the displayed image (i.e., the segmentation of an image is changed). If this segmentation is based on motion vectors, Aggarwal only says that the segmentation is changed. Aggarwal does not say anything about changing the underlying motion vectors.

Accordingly, the rejection of claims 9 and 18 is traversed.

New Claims

Claims 19-30 are new. Claims 19-28 recite a "computer program product" and include limitations similar to claims 1-18 discussed above. Accordingly, these new claims are allowable for at least the same reasons.

Claim 29 and 30 are dependent claims and include limitations removed from claims 6 and 15 respectively, and are allowable for at least the same reasons as the claims from which they depend.

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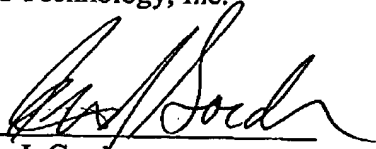Reply to the Office Action mailed: July 1, 2004

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this reply, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, please charge any fee to **Deposit Account No. 50-0876.**

Respectfully submitted,

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